

Answer Question #65356 – Physics – Electric Circuit

A certain college student and his roommate just had to listen to Pink Floyd's The Wall from start to finish. This sort of endeavor entails frequent trips to the stereo to turn up the volume, particularly when it's fun to watch the speakers shake during great songs with awesome guitar solos.² If the speakers could handle 50 W of power and had a resistance of 4.0 Ω , what amperage fuse should have been placed in the circuit to prevent blowing out the speakers?

Solution. Electric power can be calculated using the formula $P = VI$, where V – voltage, I – current. Using the formula $I = \frac{V}{R}$ (R – resistance) of Ohm's law get

$$P = VI = IRI = I^2R.$$

$$\text{Therefore } I^2 = \frac{P}{R}, I = \sqrt{\frac{P}{R}} = \sqrt{\frac{50}{4}} \approx 3.5A$$

Answer. 3.5A